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BDL-364XX

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/009885

INTERNATIONAL APPLICATION NO.

PCT/FR00/01294

INTERNATIONAL FILING DATE

12 May 2000 (12.05.00)

PRIORITY DATE CLAIMED

14 May 1999 (14.05.99)

TITLE OF INVENTION

A NIB AND METHODS OF TREATING AN ELONGATE ELEMENT DESIGNED TO FORM SUCH A NIB

APPLICANT(S) FOR DO/EO/US

JOSÉ DUEZ, VINCENT BEDHOME, PHILIPPE CHAVATTE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not transmitted by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(3)).
 - a. ☒ is attached hereto.
 - b. ☐ had been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
 FORMAL DRAWINGS (1 sheet)
 VERIFICATION OF A TRANSLATION of PCT/FR00/01294

U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 10/009885		INTERNATIONAL APPLICATION NO PCT/FR00/01294		ATTORNEY'S DOCKET NUMBER BDL-364XX	
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<p>21. <input checked="" type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,040.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00</p> <p style="text-align: right;">ENTER APPROPRIATE BASIC FEE AMOUNT =</p> <p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). \$ 0</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> <th style="width:20%;"></th> </tr> <tr> <td>Total claims</td> <td>13 - 20 =</td> <td>0</td> <td>X \$18.00</td> <td>\$ 0</td> </tr> <tr> <td>Independent claims</td> <td>1 - 3 =</td> <td>0</td> <td>X \$84.00</td> <td>\$ 0</td> </tr> <tr> <td colspan="4">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$280.00</td> </tr> </table> <p style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</p> <p><input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. \$ N/A</p> <p style="text-align: right;">SUBTOTAL =</p> <p>Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). \$ 0</p> <p style="text-align: right;">TOTAL NATIONAL FEE =</p> <p>Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property \$ 0</p> <p style="text-align: right;">TOTAL FEES ENCLOSED =</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:60%;"></td> <td style="width:20%; text-align: center;">Amount to be Refunded:</td> <td style="width:20%; text-align: center;">\$</td> </tr> <tr> <td></td> <td style="text-align: center;">Charged:</td> <td style="text-align: center;">\$</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total claims	13 - 20 =	0	X \$18.00	\$ 0	Independent claims	1 - 3 =	0	X \$84.00	\$ 0	MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$280.00		Amount to be Refunded:	\$		Charged:	\$	<p>CALCULATIONS PTO USE ONLY</p>
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a. ☒ A check in the amount of \$ 890.00 to cover the above fees is enclosed. A check in the amount of \$ _____
is enclosed for the assignment recordation fee.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.


c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 23-0804. A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b))
must be filed and granted to restore the application to pending status.**

Customer Number 207

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Date: 11-13-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application : JOSÉ DUEZ, ET AL.
Application No. :
Filed : Herewith
For : A NIB AND METHODS OF TREATING AN
ELONGATE ELEMENT DESIGNED TO FORM SUCH
A NIB
Examiner :
Attorney's Docket : BDL-364XX

Group Art Unit:

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By: _____
Charles L. Gagnebin III
Registration No. 25,467
Attorney for Applicant(s)

* * * * *
PRELIMINARY AMENDMENT

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

Sir:

Kindly enter the following Preliminary Amendment in the
above-identified application:

In the Title:

Please amend the title to read as follows:

Express Mail Number

A NIB AND METHODS OF TREATING AN ELONGATE ELEMENT DESIGNED TO
FORM SUCH A NIB

REMARKS

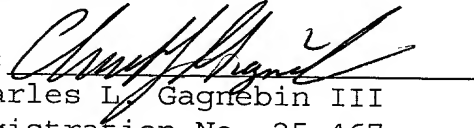
This Preliminary Amendment amends only the title of the application.

This Application contains a translation of the title and abstract as they were when originally filed by the Applicant. No account has been taken of any changes that may have been made subsequently by the PCT Authorities acting ex officio, e.g., under PCT Rules 37.2, 38.2, and/or 48.3.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter which would expedite allowance of the present application.

Respectfully submitted,

JOSÉ DUEZ, ET AL.

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A NIB AND METHODS OF TREATING AN ELONGATE ELEMENT
DESIGNED TO FORM SUCH A NIB

The present invention relates to the field of
writing implements, and more particularly to high
5 porosity nibs ensuring the transfer of ink from a liquid
ink reservoir or a fibrous reservoir to the end of said
nib serving as the writing tip.

BACKGROUND OF THE INVENTION

The nib necessarily projects from the body of the
10 implement that the user holds while writing. The ink
consumed on the writing medium is replaced as it is being
used by ink coming from the reservoir and transferred by
capillarity into the nib. When the implement is no
longer in use, a cap is fitted onto the body of the
15 implement in such a manner as to cover the nib, firstly
to protect it from possible impacts and secondly to
prevent it from drying out. If the projecting end of the
nib remains in the open air, the solvent of the ink which
is situated in the end evaporates whilst the pigment of
20 the ink remains therein. That phenomenon can be
detrimental in the sense that it may be difficult, or
indeed even impossible, to make further use of the
implement, even when a significant quantity of ink
remains in the reservoir.

25 To avoid that drawback, manufacturers of writing
implements have already proposed a certain number of
solutions for increasing the length of time it is
possible to leave a nib in the open air without any major
difficulty in using the implement again.

30 A first solution consists in modifying the
composition of the ink by adding additives of the film-
forming type. During evaporation of the solvent, a film
is formed on the surface of the nib which limits further
evaporation, said film being very fragile so that it is
35 eliminated when the user applies the nib once again on
the writing medium.

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A similar solution is adopted in document J 54019826 in which the nib is coated in a high polymer that is gastight and easy to peel off. By way of example, the high polymer can be a copolymer resin of vinyl chloride and of vinyl acetate, or an EVA copolymer resin. In that document, such a coating is provided merely to prevent the ink from evaporating, and the nib from drying out during storage and transport of the writing implements, given that the high polymer coating is easily removed before use.

OBJECTS AND SUMMARY OF THE INVENTION

The first object set by the Applicant is to propose a nib which mitigates the above-mentioned drawback by significantly increasing the length of time it is possible to leave said nib in the open air, without any effects that prevent the implement being used.

This object is fully achieved by the nib which, in known manner, is constituted by a segment of an elongate element of high porosity material, with at least a first end shaped to form a writing tip.

In characteristic manner, the pores and/or capillaries of said material are blocked over a limited thickness e at the longitudinal outer periphery of the elongate element, with the exception of the first end.

For an elongate element of circular cross-section, having a diameter lying in the range 2 mm to 15 mm, the thickness e preferably lies in the range 0.01 mm to 1 mm.

In a first variant embodiment, the nib includes a sealing agent which blocks the pores and/or the capillaries of said material over said thickness e .

This variant is particularly suitable when the elongate element is a rod that is constituted by fibers that have previously been held together by a binder. For acrylic fibers that are held together by a melamine formaldehyde (MF) resin, for example, the sealing agent can also be an MF resin. For polyester fibers, for example, the sealing agent can be either an acid-

catalyzed melamine resin, or a melamine urea-formaldehyde resin, or a two-component epoxy resin, or a two-component polyurethane resin.

5 In a second variant embodiment, the elongate element is constituted by a hot-melting material, and the pores and/or capillaries are blocked by localized hot-melting of said material over said thickness e. This second variant is particularly suitable when the elongate element is constituted by sintered microbeads.

10 Another object of the invention is to propose methods of treating high-porosity elongate elements, designed to form the above-mentioned nibs, in accordance with the first and second variants.

15 In the first variant, the method of the invention consists firstly in continuously impregnating a coherent high-porosity, elongate element with a sealing bath having a sealing agent that is inert relative to the components of the ink, impregnation being performed under conditions of concentration, of surface tension, of
20 viscosity, and of time in particular, such that said bath diffuses into the elongate element over a limited thickness e at its periphery, and said method consists secondly in setting the sealing agent.

25 During manufacture of the nib from the elongate element, said elongate element is cut into segments, and each segment is machined at least at the end designed to form the writing tip. As a result, the central zones of the cut and machined ends are exempt of sealing agent and enable ink to be transferred normally. In contrast, the
30 sealing agent blocks the pores or capillaries on the surface of the elongate element, thereby creating a barrier preventing the ink solvent from evaporating.

35 Most nibs are constituted from fibers which are presented in the form of a tow or ribbon and which are joined and bonded together by a binder to form a coherent, elongate element referred to as a rod. In this case, said binder is preferably used as the sealing agent

in the method of the invention. This particular disposition presents many advantages. The binders used to form nibs from fibers are well known. There is therefore no risk in choosing such binders as sealing agents with regard to the stability over time and the inertness with regard to the ink. In addition, manufacturers are entirely familiar with the techniques of cutting and machining nibs out of known fibers and binders. Thus, sealing the periphery of the nib with the same agent is therefore unlikely to disrupt the operation of conventional tooling to any significant extent, in contrast to what could happen if some other compound were to be used as the sealing agent.

For a nib based on acrylic fibers, in particular, the compound acting as binder and sealing agent is preferably an acid-catalyzed melamine resin.

The sealing agent is generally set merely by subjecting the elongate element to heat treatment (heating or cooling) after the impregnation operation.

In the second variant embodiment, the method of the invention consists in applying a thermal shock over the longitudinal periphery of the elongate element or of the segment of elongate element, with the exception of the first end which forms the writing tip, so as to obtain localized hot-melting of the hot-melting material over a thickness \underline{e} .

The operating conditions of the shock treatment are a function of the material constituting the elongate element. For an elongate element made of polypropylene microbeads, in particular, the thermal shock is performed at a temperature lying in the range 200°C to 300°C for a period of 1 second (s) to 10 s.

BRIEF DESCRIPTION OF THE DRAWING

The present invention will be better understood on reading the following description of an implementation of the method for treating a rod of acrylic fibers for use

in the manufacture of a nib, shown in the accompanying drawing, in which:

Figure 1 is a diagram of an installation implementing said method; and

5 Figure 2 is a perspective view of a nib obtained from the rod treated thereby.

MORE DETAILED DESCRIPTION

10 In implements having liquid ink or a fibrous reservoir, the ink is transferred via a coherent high-porosity, elongate element enabling the ink to be transferred, by means of its capillarity, from the reservoir to the writing tip while said writing tip is consuming the ink.

15 In a first variant embodiment, the nib is made from a tow of continuous filaments or from a ribbon of discontinuous fibers, in particular acrylic fibers, juxtaposed and held together to form a coherent rod. The continuous rod is cut to form segments of determined length having at least one end that is machined to form
20 the writing tip. The machining requirements are a function of the type of writing implement envisaged. The machining can form two beveled edges and a rounded end as in document EP 0 857 586 or any other appropriate shape.

25 The ink that is consumed by being deposited on a writing medium is replaced as it is being used by ink which diffuses into the nib through the pores and capillaries.

30 According to the invention, the rod from which the nibs are taken is subjected to special treatment for limiting the unacceptable phenomenon of the nib drying out when the implement remains uncapped, i.e. when the nib remains in the open air for a long period of time, e.g. several hours, or indeed several days.

35 In this first variant, the treatment of the invention consists in impregnating the rod as it moves continuously through a treatment bath containing a sealing agent. The term "sealing agent" refers to a

compound that is suitable for filling the pores or capillaries of the material constituting the tow in such a manner that, once said compound has set, the pores or capillaries are plugged and a substantially airtight
 5 barrier is thus created preventing the ink solvent from evaporating or limiting evaporation thereof.

Once impregnated, the rod is subjected to an additional operation of setting the sealing agent. This operation depends on the type of compound used as the
 10 sealing agent in the treatment bath. It is generally heat treatment requiring a heat supply in order to evaporate the bath solvent, or in order to cross-link or polymerize the sealing agent, or it may even require cooling when the sealing agent is a paraffin that is
 15 applied when hot.

The operating conditions under which impregnation is performed must be determined in such a manner that the sealing agent is diffused over a limited thickness e at the longitudinal outer periphery of the tow. The
 20 thickness e must be sufficient to block the network of pores and capillaries at the surface completely and to create the barrier phenomenon. It is not desirable for the thickness e to be too thick insofar as the presence of the sealing agent correspondingly reduces the
 25 effectiveness of the rod with regard to its primary function which is to transfer ink by capillarity.

For a rod of circular section, having a diameter lying in the range 2 mm to 15 mm, it has been found that the diffusion thickness e for the sealing agent should
 30 lie in the range 0.01 mm to 1 mm.

Figure 1 is highly diagrammatic and shows the two treatment stages of the invention using a device 1 successively comprising, along the path of the rod 2, an impregnation head 3 and a setting oven 4.

35 The impregnation head is constituted by a reservoir 5 containing the treatment bath 6. Two facing vertical walls 7, 7' of the reservoir 5 are pierced with two

openings 8, 8' that are shaped exactly like the cross-section of the rod 2. Each opening 8, 8' is extended outwards by a shoulder 9, 9', in particular an annular shoulder when the cross-section of the rod is circular.

5 The method is implemented by inserting the rod 2 through the shoulders 9, 9' and the openings 8, 8' of the impregnation head, and through the openings 10, 10' of the setting oven 4.

10 The rod is drawn continuously through the impregnation head 3 and the setting oven 4.

 As mentioned above, the size of the openings 8, 8' and of the shoulders 9, 9' matches the cross-section of the rod 2 in such a manner that the rod 2 itself cooperates with the inside wall of the shoulders 9, 9' to form a gasket, preventing the treatment bath 6 from escaping directly.

20 During continuous displacement of the rod 2 through the impregnation head 3, the treatment bath 6 naturally diffuses through the pores and the capillaries situated on the longitudinal outer periphery of the rod 2. The diffusion takes place over a thickness e . The sealing agent which is contained in the treatment bath and which has diffused over said thickness is then set by the tow 2 passing through the setting oven 4.

25 It is easy for the person skilled in the art to modify and control the thickness e by adjusting various parameters which influence the diffusion of the treatment bath and thus of the sealing agent, in particular the viscosity of the bath, the contact time, the surface tensions of the rod and of the bath, and the concentration of sealing agent (dry extract) in the bath.

30 The function of the sealing agent is to block the pores and/or capillaries which are situated on the outer peripheral surface of the tow 2. It is essential for the sealing agent to be insoluble and chemically inert relative to the various constituents of the ink which is

to be used in the writing implement, and in particular relative to the solvent of said ink.

The sealing agent can be a paraffin having a very high melting point, e.g. lying in the range 67°C to 70°C, which is used in a writing implement having an alcohol-based ink. The sealing agent could be a two-component epoxy or polyurethane resin.

However, when the rod 2 is made of fibers that are bound together, the same compound that serves as a binder for the fibers is preferably also used as the sealing agent.

Given that such binders are already used by manufacturers of nibs, said manufacturers are perfectly aware of their insolubility and their chemical inertness relative to the inks used. In addition, manufacturers are entirely familiar with the cutting and machining operations to be performed on the corresponding rods, so they can easily adapt the cutting and the machining of rods to the invention since the compounds are the same and only the quantity of binding/sealing agent is increased. This avoids the risks inherent in introducing some other compound, in particular the risks of clogging the various tools serving to cut and machine the nib.

The rod 2' obtained at the outlet of the setting oven is cut into segments of length L, each segment being designed to constitute a nib 11, as shown in Figure 2. In the example, only the front end 12 of the nib 11 is machined in order to form the writing tip 13, the rear end 14 resulting from the transverse cut of the rod 2'. The front end 12 is sharpened, with a rounded end forming the writing tip 13.

The nib 11 thus includes a cylindrical rear portion 16 and a converging front portion 17 terminated by the writing tip 13.

In the cylindrical rear portion 16, the pores or capillaries situated on the outer periphery are sealed by a sealing agent 15 over a thickness \underline{e} .

When the nib 11 is assembled in a writing implement, it is filled with ink, in known manner, in the capillaries of the unsealed central zone of the fibers. The central zone 18 extends from the rear end 14 to the writing tip 13. In the cylindrical rear portion 16, the central zone 18 is surrounded by the outer peripheral zone 19 in which the sealing agent is situated, said peripheral zone creating a substantially airtight barrier preventing the ink solvent from evaporating or limiting evaporation thereof.

Thus, when the nib 11 is positioned in the writing implement, its rear end 14 comes directly into contact with the ink of the reservoir which diffuses by caprillarity through the unsealed fibers of the central zone 18 to the writing tip 13.

With regard to the portion that projects outside the body of the writing implement, only the converging front portion 17 includes ink-impregnated fibers which can be exposed directly to the open air. The person skilled in the art must choose the method of machining said portion 17 in such a manner as to limit the area which is exposed to the open air while maintaining an acceptable writing tip 13.

For a rod made of acrylic fibers, the sealing agent 15 is preferably an acid-catalyzed MF resin which is also used as a binder for binding the acrylic fibers together in the structure of the rod 2. The sealing agent can be an MF resin having 90% dry extract, e.g. as marketed by HOECHST in the MAPRENAL range or by MONSANTO in the RESIMENE range.

By way of example, the following conditions have been implemented with said MF resin: speed of displacement of the rod of 30 centimeters per minute (cm/mn) for an impregnation length of 3 cm; ambient temperature; viscosity of the bath adjusted with thixotropic agents (bentonite, silica, or polyurethane thickening) to approximately 10000 centipoise (cPo); and

surface tension of the bath lying in the range 23 dynes per centimeter (dyn/cm) to 25 dyn/cm.

For a rod made of polyester fibers, the sealing agent is preferably an acid-catalyzed melamine resin, a
5 melamine urea-formaldehyde resin, a two-component epoxy resin, or a two-component polyurethane resin.

In a second variant embodiment, the nib is made from sintered microbeads. In this case, the microbeads are placed in a mold having an inside configuration that is
10 the configuration desired for the nib, and sintering is obtained by an appropriate heat treatment enabling the desired microporous structure to be achieved through the interconnection of the various microbeads.

In this second variant, the treatment method of the
15 invention consists in applying a thermal shock over the segment of elongate element, with the exception of the first end which forms the writing tip and with the exception of the transverse face of the second end, so as to obtain localized hot-melting of the microbeads at the
20 longitudinal periphery of the segment over a limited thickness e . Said thermal shock is applied under operating conditions that are determined so that the localized hot-melting of the microbeads enables the surface pores of the elongate element to be blocked. In
25 this case, there is therefore no need to add a sealing agent, since the constituent material of the microbeads is used as the sealing agent for the surface pores.

In an embodiment in which the microbeads are made of polypropylene, the thermal shock is performed at a
30 temperature lying in the range 200°C to 300°C, and preferably about 270°C, for a period of 1 s to 10 s, and preferably about 5 s.

It should be noted that localized hot-melting on the surface of the microbeads has the secondary technical
35 effect of increasing the strength of the elongate element. Until now, for an elongate element made from sintered microbeads, its porosity was limited because of

insufficient strength. By increasing its strength by means of the hot-melted peripheral zone, it becomes possible to increase the porosity of the middle zone which transfers the ink correspondingly. The same result
5 could possibly be obtained by implementing the method of the first variant, namely impregnation with a sealing agent.

CLAIMS

- 1/ A nib constituted by a segment of a coherent, elongate element of high porosity material, with at least a first end shaped to form a writing tip, wherein the pores and/or capillaries of said material are blocked over a limited thickness e at the longitudinal outer periphery of the elongate element, with the exception of the first end forming a writing tip.
- 2/ A nib according to claim 1, wherein for an elongate element of circular cross-section, having a diameter lying in the range 2 mm to 15 mm, the thickness e lies in the range 0.01 mm to 1 mm.
- 3/ A nib according to claim 1, including a sealing agent which blocks the pores and/or the capillaries of said material over said thickness e.
- 4/ A nib according to claim 3, wherein the elongate element is a rod that is constituted by acrylic fibers that are held together by an MF resin, and wherein the sealing agent is also an MF resin.
- 5/ A nib according to claim 3, wherein the elongate element is a rod that is constituted by polyester fibers, and wherein the sealing agent is an acid-catalyzed melamine resin, a melamine urea-formaldehyde resin, a two-component epoxy resin, or a two-component polyurethane resin.
- 6/ A nib according to claim 1, wherein the elongate element is constituted by sintered microbeads, and wherein the pores are blocked by localized hot-melting of said microbeads over said thickness e.
- 7/ A method of treating a coherent high porosity, elongate element designed to form a nib according to

claim 3, the method consisting firstly in continuously impregnating said elongate element with a sealing bath having a sealing agent that is inert relative to the components of the ink, impregnation being performed under
5 conditions of viscosity, of time, of surface tensions, and of concentration in particular, such that said bath diffuses into the elongate element over a limited thickness e at its longitudinal periphery, and said method consists secondly in setting the sealing agent.

10 8/ A method according to claim 7, wherein the elongate element is a rod that is constituted by fibers that are secured by a binder, and said binder is used as the sealing agent.

15 9/ A method according to claim 8, wherein the rod is based on acrylic fibers, and the binding and sealing agent is an acid-catalyzed MF resin.

20 10/ A method according to claim 7, wherein the sealing agent is set by subjecting the elongate element to heat treatment.

25 11/ A nib obtained by cutting into segments and machining a high porosity elongate element treated according to the method of claim 7.

30 12/ A method of treating a segment of coherent high porosity, elongate element designed to form a nib according to claim 6, wherein said segment is obtained by molding and sintering microbeads, and said method consists in applying a longitudinal, peripheral, thermal shock over the segment, with the exception of the first end which forms the writing tip, so as to obtain
35 localized hot-melting of the microbeads over a thickness e.

13/ A method according to claim 12, wherein the thermal shock is performed at a temperature lying in the range 200°C to 300°C for a period of 1 second (s) to 10 s.

Attorney
Docket No.: BDL-364XX

DECLARATION AND POWER OF ATTORNEY

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A NIB AND METHODS OF TREATING AN ELONGATE ELEMENT
DESIGNED TO FORM SUCH A NIB

The specification of which (check one):

☐ is attached hereto. ☒ was filed on November 13, 2001 as Application No. 10/009,885 ;
amended on _____ (if applicable).

☒ was filed as PCT International. Appl. No. PCT/FR00/01294 on May 12, 2000 ,
and was amended under PCT Article 19 on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim foreign priority benefits under Title 35, USC §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

<u>Prior Foreign Application(s)</u>		<u>Date Filed</u>	<u>Priority Claimed</u>	
<u>99 06312</u> (Number)	<u>France</u> (Country)	<u>14 May 1999</u> (Day/Month/Year)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<u> </u> (Number)	<u> </u> (Country)	<u> </u> (Day/Month/Year)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u> </u> (Number)	<u> </u> (Country)	<u> </u> (Day/Month/Year)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, USC §119(e) of any United States provisional application(s) listed below:

<u> </u> (Application Number)	<u> </u> (Filing Date)
<u> </u> (Application Number)	<u> </u> (Filing Date)
<u> </u> (Application Number)	<u> </u> (Filing Date)

Express Mail Number

EV 009950011 US

10/01

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Attorney
Docket No.: BDL-364XX

I hereby claim the benefit under Title 35 USC §120 of any United States application(s) listed below and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 USC §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application No.)	(Filing Date)	(Patented/pending/abandoned)
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(Application No.)	(Filing Date)	(Patented/pending/abandoned)
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(Application No.)	(Filing Date)	(Patented/pending/abandoned)
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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business connected therewith in the Patent and Trademark Office, and to file with the USRO any International Application based thereon.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Docket No.: BDL-364XX

2-00

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10/01

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Attorney
Docket No.: BDL-364XX

3-00

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